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EDITORIAL

DR. W. B. BREBNER.

It was with great sorrow that the news of the sudden death of Dr. W. B. Brebner was received by his many friends in Toronto.

Dr. Brebner graduated from University of Toronto, Faculty of Medicine, in 1927. For two years after graduation he remained in Toronto, doing post-graduate work. In 1929 he was attracted to Washington University, St. Louis, Mo., at which place he began researches in connection with acute poliomyelitis. In 1931 he became associated with the Bureau of Laboratories of the Health Department of New York City, where he continued his work with poliomyelitis. It was while he was engaged in this work that he contracted his fatal illness, being bitten by an experimental animal. The illness rapidly progressed until he died on November 9, 1932.

Dr. Brebner, while his research activities had just begun, had become actively associated with the research work of infantile paralysis. He was associated with an experimental inoculation of children against the disease which is reported to have been quite successful in producing an immunity. It is sincerely regretted that this young graduate of Toronto was not able to continue in his work at which he had made such a brilliant beginning.

His sudden death was widely mourned in Toronto by the large number of his friends, with whom he had been associated at the University of Toronto.

H. D. KAY, O.B.E., Ph.D. OF CAMB., D.Sc. OF MANC.

Recently, announcement was made of the resignation of Dr. H. D. Kay, Professor of Biochemistry. He leaves us shortly to take up his duties as Director of Research at the Dairying Institute, Reading, England.

His training was taken at the Universities of Cambridge and of Manchester. The former granted him his Ph.D., and the latter his D.Sc. Following these, he devoted several years to research work at the Lister Institute and at the Medical Unit of the London Hospital. In the autumn of 1929 he assumed his duties at the University of Toronto.

Those who have come under his tutelage during the ensuing years have recognized his sound scientific ability and his broad general knowledge At the same time they have come to appreciate his kindly and real interest in each individual student. It is with genuine regret that we learn of his departure from our University. We venture to express the hope that his stay with us has been as happy for him as it has been for us. All his many friends join in wishing him "Godspeed."

H. D. Jenner.

U. OF T. MEDICAL PERSONALS.

Dean FitzGerald.

It is with a great deal of pleasure and a feeling of pride that we record that Dean J. F. FitzGerald has been appointed to the position of Third Vice-President of the Health Committee of the League of Nations. This should appeal to the student as a further evidence of the fact that the Medical School at Toronto is playing a large part in the world-wide progress of medicine.

Two former Editors of the Journal have recently been honoured. We speak of Dr. W. S. Keith and Dr. F. G. Kergin. Dr. Keith was awarded the Armstrong Peters Prize in Surgery; and Dr. Kergin was successful in passing his primary examinations for the F.R.C.S. (Eng.).

THE MEDICAL SOCIETY.

The first regular open meeting of the Medical Society of the University of Toronto was held on Thursday, November 17th. Over two hundred undergraduates were present to hear Professor Oscar Klotz speak on "Medicine in the Tropics." From his wide experience in West Africa and in Brazil, Dr. Klotz described the conditions which have a bearing on disease—the heat, the humidity and the extreme variability of temperature one may encounter. Then he drew delightful word-pictures of the tropical jungle, with its peculiar flora and fauna. The speaker stressed especially the insect life, "the great menace to mankind in the tropics."

"Medicine in the tropics," continued Dr. Klotz, "is not very different from that here in many respects. However, there are diseases peculiar to the tropics on account of the peculiar environmental conditions. In these the insect as a vector of disease is of supreme importance."

In closing, the speaker drew attention to the opportunities for young graduates for service in tropical countries now that the door to the United States is virtually closed to them.

It is with profound regret that we learn of the deaths of two promising students of the Third Year class, Mr. F. N. Cowan, whose home was in Winnipeg, and Mr. R. L. Irwin, of Whitby, Ontario. To the bereaved relatives and friends, we extend the heartfelt sympathy of every medical student.

A NERVOUS BREAKDOWN*

By I. C. SHERMAN, '33.

Introduction.

One of the commonest modern expressions used by the profession and laity alike is "a nervous breakdown." It vies for supremacy of hackneyed words only perhaps with one other—"inferiority complex."

The meaning of a nervous breakdown is too rapidly taken for granted and as a consequence, its limitations are apt to be misunderstood. This came to my attention only too well when I found how inadequate was the scientific literature in explaining the significance of this ubiquitous term. The advances in psychiatry in the past twenty years have been truly remarkable. A great deal of information regarding the various types of neuroses and psychoses has been uncovered, yet information is sadly lacking regarding the comprehension of the one of the most popular diagnoses made by the general practitioner. It is true that formerly physicians seemed to be but little interested in the functional neuroses and minor psychoses, but experience during and after the war, and the development of psychiatric clinics have greatly stimulated the interest, not only of medical teachers, but also of practitioners, in the milder forms of mental disturbance. Despite this, the popular "nervous breakdown" remains as indefinite a term as it ever was in the minds of most of us, although we use it so glibly.

It is not my intention to treat the subject from a strictly clinical aspect. It is more my desire to give you the perspective of a general practitioner as I see it. If I can describe to you the significance of the term, indicating what it includes and excludes, giving some idea of etiology, I shall fulfil my purpose. The clinical point of view I am certain will be fully covered in the ensuing discussion.

Definition.

How can one define "nervous breakdown?" Is it clearly distinguishable from a mental breakdown, or are they synonymous? A physician, and even any intelligent layman, may tell you that Mr. Smith, whom the psychiatrist labels a schizophrenic, is mentally ill and requires hospital treatment. They will argue strenuously that Mr. Smith has retained his higher faculties of thought and his mind is in a fairly sound condition, whereas Mr. Jones is incapable of thinking and behaving normally or even approximately so, therefore he is suffering a mental collapse. On further analysis we recognize that a mentally diseased individual has a profound disturbance in the spheres of thought, feeling, and conduct; for it is really these three factors which constitute mentality. However, after a moment's cogitation, we readily realize that our case of anxiety neurosis — the individual suffering a nervous breakdown—shows some upset in these three spheres, which at first sight is not so striking. It is true that the aberration from the normal is not as great as in the mentally diseased individual, yet no one can deny its existence. So this criterion for dividing the nervous from the mental case fails us.

It has been found that the only distinction is really no distinction. The one concept that has remained to be of any practical value in discriminating between the two is that of degree. Just as there are all all degrees of abnormal behaviour and one shades imperceptibly into the next so that it is difficult sometimes to recognize the abnormal from the normal, so does the nervous case shade imperceptibly into the

* A paper read before the Alpha Omega Alpha Fraternity, Ontario Hospital, Whitby, November 21, 1932.

mental case. Just as we cannot say when day actually becomes night, so we cannot say definitely when a nervous breakdown becomes a mental breakdown. It must be remembered that they are both mental phenomena differing only in quantity and perhaps quality.

The criteria for the recognition of the severer disorders, such as outspoken mania, melancholia and well-developed schizophrenia are now well known. The symptoms in these are so anti-social that the patients have to be treated in institutions to which, for their own safety and for the safety of those about them, they must be committed. But there is every gradation from such severe mental disorders down to the mild forms occurring in every day practice, which are usually called nervous breakdowns. We find that such people fight shy of the psychiatrist because they have been educated to the belief that there is something shameful about mental troubles; that they should be overcome by an effort of the will; and that if they fail to do this they must be crazy.

An illustration in point is the mother who is worried and depressed because of the tragic death of her only child in which she may have played some unfortunate part. This grief reaction is all very natural because she loved the child; as a consequence she is said to have a nervous breakdown. This depression may become more marked. She refuses all food. She takes upon herself all the sins of the world. In short, she now suffers a severe melancholia which may even end in suicide. Indeed, she may so effectively rationalize and repress the painful idea as to go into an elated state where she claims her child has gone away to become an important personage, and is too occupied to return. Her condition is now one of phantasy. In either case she may lose all contact with the outside world and is looked upon as mentally ill. A definite time of transition cannot be detected in the graduation of symptomatology from mild to severe; but the two ends of the scale are obvious.

It is suggested that the popular term nervous breakdown be retained for the mild mental disorders, with the full realization that it is not scientific and has certain elastic limitations. It allows a differentiation from the more advanced serious conditions. Since its use is so wide-spread its eradication would be difficult. In addition it avoids the fear of the stigma which the laity still retain in being advised that one of their consanguindes has a mental disease. However, it is desirable to carefully describe to the patient the fact that the symptoms are mental in origin, and not due to some mysterious ogre lurking in the background ready to pounce upon its victim from an unseen world. Often, if we tell them they have long suffered a disorder of the mind, familiarity breeds contempt in the face of such outspoken fears. The use of this nomenclature does not remove the necessity to ferret out the true nature of the condition, in order to recognize perhaps the early phase of a manic-depressive psychosis or a mild schizophrenia.

Limitations.

We may clarify the situation by more closely limiting the condition. We readily accept that it includes the milder degrees of functional mental illness or the neuroses. These are the so-called "part-reactions" which do not involve a disturbance of the whole personality. They are really a small number of the cases of psychogenic origin which reach mental institutions, but they form one of the greatest portions of a family physician's practice if he be fully alive to the situation. The difference between the normal and neurotic individual is again a matter of degree. One author describes this adequately by saying, "The recognition of the neurotic as opposed to the normal is largely a question of degree

to which neurotic potentialities manifest themselves."

I do not suggest we include the psychogenic psychoses in toto because the two most important types—manic-depressive and schizophrenia — fall within the group of severe affective disorders. In their early stages these may be considered as nervous breakdowns, when for example the manic-depressive has his first attack of depression from which he quickly escapes. However, a complete analysis of the case must always be carried out. This will usually divulge the true nature of the condition and alter our prognosis and with it the diagnosis considerably.

It excludes congenital feeble-mindedness and all psychoses which have been definitely proven to have a physical basis, e.g., general paresis of the insane, senile decay, brain tumour, and results of drug and alchol addiction, toxic conditions and so on. We must be aware of the fact that a nervous breakdown may precede the recognition of an organic lesion to account for mental symptoms. The change in behaviour as an early sign in neurosyphilis is well known and we are inclined to class the individual into our mild mental disturbances at that time. When this organic lesion is recognized we know we are dealing with an organic psychosis which carries with it a far graver prognosis than any nervous breakdown. The logical procedure, of course, is to make a complete physical and laboratory examination in each case. We must be cautious in attributing all the mental symptoms to some organic lesion such as suspected cerebral arteriosclerosis. The organic change may play only a small part in the individual's nervous condition.

May I sound a warning here that I am not attempting to make any clinical classification of mental diseases. I am suggesting that whatever be the cause of the mild mental aberration—organic or psychic—we include the condition in our category of nervous breakdown. We should, however, exclude the unquestionably organogenic and psychogenic psychoses which are the true mental diseases. The typical early cases of schizophrenia, recurrent mania and depression, and organic psychoses comprise only a small proportion of the great flood of patients which is at present filling mental institutions. Some of them are recognized and kept at home. Most of them come under our conception of a nervous breakdown. Although given this name it is essential that their true nature be recognized, as is often not done, so that there will be no harmful meddling or they will not be neglected.

Personality.

An insight into the different personality types is of great value in understanding why different individuals react in diametrically opposed ways when the do suffer a breakdown. It is also of extreme importance in deciding upon the treatment and how guarded the prognosis shall be. Can we determine why one patient has an affective disorder of a manic type, whereas the next one reacts to a similar situation by going into a melancholic state?

For this purpose we may accept all people as having a place on a temperamental scale. At the extreme ends the types are clearly differentiated. At one end we have what Jung described as the introvert, and which has been called the schizoid or closed type. At the other end is what Jung spoke of as the extrovert, and which has been called the cyclothymic or open type.

In the closed type the thoughts and mental processes are closely guarded. The indivdual is unsocial; has no friends and keeps to himself. More and more does he shun the world, taking less and less part in its activities. He becomes idle, lethargic and untidy. If interfered with he may become irritated and violent. He is particularly disposed to depressive states and it is this type which ultimately becomes

the victim of that dreaded malady, schizophrenia. However, it is those with a slight schizoid personality who do the world's work. They are steady, persevering, quiet, thoughtful people who will pursue a given task to its conclusion.

The open type is very changeable, brilliant, but usually shallow. Interest flags easily. The mood is variable. At times the person is elated, very energetic; the next morning we may find him blue, depressed and retarded. This alternative between elation and depression may develop into a full-blown manic-depressive psychosis.

The vast majority of sane people, but also many "nervous" and frankly "insane" people are somewhere near the middle zone of this scale between the open and closed types. These ambiverts are of greater interest to us insofar as they are very close to normal and often indistinguishable from normal, yet they may at any age develop mental trouble. The fact that their personality was of a rather wholesome nature to begin with does not carry with it the serious prognosis of a disturbance in the extreme open or closed types. It is true that those who eventually break down, frequently show for years before visible evidences of certain dangerous characteristics and mental processes. In this way they may be distinguished from the entirely normal.

In general there are two types of reaction in these middle-zone individuals, depending on the trend of their personality. If they are inclined towards the closed type it is readily understood why their reaction is one of depression. On the other hand a tendency towards the open personality explains a manic condition. In those individuals who seem to be quite well-balanced previous to their breakdown it is not uncommon to find a mixture or alternation of the two. I need not mention that there are all degrees of these reactions and they are not always true to type.

Etiology.

What causes an apparently normal personality to escape from the trials and tribulations of daily life by means of a nervous reaction? We see such patients, who have for years carried on their daily duties under a more or less severe load, only to escape, temporarily at least, from all their responsibilities through an attack of depression or mania, or more permanently by shutting themselves off from reality into a world of phantasy, where all their long cherished dreams and desires are fulfilled. An inquiry into the causation of these escape reactions or "mental suicides" is of considerable interest.

A very popular conception of the situation has been the seed and soil theory. The seed refers to the exogenic factors—either somatic or psychic; the soil refers to the individual's constitution or heredity plus the effect of environment upon it. We may exemplify this by taking two extreme cases in each of which only one of these factors is operative.

An individual who receives a blow on the head sufficient to daze him or even render him unconscious, may be considered as suffering a temporary nervous upset due to the somatic trauma. In this case the exogenic factor or seed alone is in force. Any person receiving a similar blow would likely behave similarly. The opposite extreme is one in which no exogenic cause is found to explain the individual's behaviour. A gross example occurs in the congenitally feeble-minded, such as the misrocephalic idiot. He is born with a deficiency of cerebral tissue and no amount of teaching will help him past a certain limit. This person has a make-up or soil sufficient to explain his mental condition. It is superfluous to bring into consideration any exogenic cause.

Of course, between these two extremes, we have the vast majority who suffer nervous breakdowns in which one factor alone is insufficient to ex-

plain the reactions. At times the exogenic seems to be more important, then again the constitutional claims preference. Aside from such conditions as mentioned we must take both factors into consideration in discussing the cause of a nervous breakdown; since almost invariably both exist.

We must appreciate that the precipitating factor in such conditions is exogenic. It consists of some stress or conflict due to trouble occurring in the patient's life. This "psychic rock" or mental insult may not be discernible to the outside world except by deep analysis. Although it is called a psychic rock it may be either somatic, i.e., trauma causing mental change, or purely mental in origin. Individuals who might otherwise lead normal and happy lives are often driven into neuroses and even psychoses by environmental situations which are too difficult for them and to which they are unable to adjust.

In addition to this we must consider the endogenic factor which helps us to understand why some people break on a psychic rock which the majority will surmount with safety.

It is commonly found that individuals who suffer a nervous breakdown have a peculiar emotional constitution. Their feelings are very precious. They suffer intensely whenever there is an insult or injury to their emotional life. They are completely absorbed in themselves and their own troubles, but do not lose all contact with the world. In short, for years before their collapse, they suffer from what is known as "magnification of the ego" or undue enlargement of the self. If such a person encounters a psychic rock of any magnitude it is readily seen that this disposition will greatly intensify its effects on his feelings. If a decision is to be made involving laceration of his emotions he will be vacillating, unable to face facts and to decide on any sensible fixed course. As a result there is a tendency towards an illogical road of escape in an attempt to avoid wounding the ego.

It has long been recognized that the most important factor in the causation of mental disease is the soil with which we have to deal. It depends upon the heredity and constitution, with its magnification of the ego, as to whether a certain exogenic precipitating factor is going to shake the the stability of one's mental status. Two individuals may be exposed to the same mental and physical trauma, yet their mental reaction is entirely different. The one who responds abnormally and develops neurotic manifestations is said to have had a neurotic make-up—the known or unknown trauma serving merely to start the onset of the neurosis.

Clinical Review.

A brief review of the main clinical types of nervous breakdown assists in elucidating the condition. These constitute the neuroses, along with the

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reactions of simple elation and depression from any cause whatever.

The neuroses, or psychoneuroses as they are often called, represent the ordinary functional diseases of the nervous system, being the various forms of "nervousness" commonly encountered by the layman. May I remind you that although we can point out a world of difference between a full-fledged neurosis on the one hand and a well-developed psychosis on the other hand, we must not forget that there is many a case which is difficult or even impossible to assign definitely to either group.

As I have mentioned, a neurosis is a so-called "part-reaction" in which only part of the personality is involved. Very often the personality shows no outward change. On the other hand a true mental disease or psychosis affects a change in the total personality. In addition the psychotic has an abnormal idea of reality and behaves in accordance with this distorted outlook. In the neurotic reality remains qualitatively unchanged, although it may be diminished in quantity. He reacts as if reality has the same meaning to him as to anyone else except that there is a decrease in his mental and physical output. The neurotic is in full contact with the world; is aware of his surroundings; shows no language disturbance; has not the primitive reactions which we often find in the psychotic, such as soiling and wetting. With these differences in mind, it is not difficult for us to understand why neurotics do not often reach mental institutions whereas psychotics are more frequently committed.

The commonest types of neuroses are neurasthenia, anxiety states, hysteria and psychasthenia. We must not be too dogmatic about assigning such diagnoses to patients becfause it is unusual to find clear-cut cases. Mixtures of the different reactions are more frequently found. All of them have some symptoms of the neurasthenic, i.e., a general decrease in mental and physical energy, yet there are certain characteristics of each superimposed upon these. It is inadvisable to label such patients too hastily, but our efforts would be more profitably directed in thoroughly analyzing and understanding the individual rather than trying to fit him into an artificial classification.

With this warning I shall describe very briefly each neurosis as a separate type in order to obtain some concrete idea of what these reactions constitute.

1. *Neurasthenia.*—The pure form as described by A. Meyer is rarely seen. It consists of "mental and physical fatigue associated with sensations of pressure in the head, poor memory, inability to concentrate, irritability of temper, poor sleep, and various aches and pains." It is apt to follow upon illnesses from which the convelescence is prolonged. These individuals lose much of their usual interest in life and are trying people to live with because of their litany of complaint and their insistence that life is hardly worth while. The constant presence of depression and vague fears may confuse the issue with anxiety states. There is a classical asthenic physique consisting of the long, narrow thorax, long neck and limbs, small muscles and visceroptosis.

One of the common forms of neurasthenia deserving of special mention is the sexual type. It is more usual in men than women. These people are particularly worried about their sexual nature: usually imaging they are impotent and have lost their manhood. It is not surprising that such a condition exists because proper sex education is denied the adolescents at a time when it is needed most. There is no necessity for making the population extremely sex conscious, or adhering to the pansexual concept of the neuroses with which Freudian psychoanalysis is so concerned.

2. *Anxiety States.*—These are characterized by morbid anxiety or fear. Such attacks are not uncommon in the course of other mental illnesses. There is a general attitude of anxious mindedness such as arriving pathologically

early for trains or their wedding. We find such somatic symptoms as palpitation, dyspnoea, anorexia, flatulence, constipation, diarrhoea, general fatigue and a host of others for which the nerrassed psysician can find no cause. There are mental symptoms, including fears of all kinds—especially insanity and bodily illness. Secondary to these are lack of concentration, inability to do things, depression, irritability, and even excitability.

This condition finds its origin in all types of conflict of one's needs with reality. It is not always sexual in nature. However, amongst the chief factors causing anxiety states are sex-coitus interruptus or any sex arousal without an adequate outlet; financial stress—in men who are carying the strain of a failing business; physical disabilities—true or imaginary.

3. *Hysteria.*—A person with an hysterical constitution is unable to act in a decisive way when faced with a difficult problem. He vacillates in the solution of his conflict, finally solving it in a wholly inadequate manner by the development of hysteria. A well-known example is the soldier in the trenches who is expecting the command to go over the top in a few days. He is rather suddenly seized with a paralyis of both legs so as to completely incapacitate him.

Hysterics are supersuggestible to an extreme degree. Their symptoms are readily produced and removed by suggestion in the waking or hypnotic state. The manifestations are physical and mental. Some of the physical ones are: (a) motor—paralysis, tics, tremors; (b) sensory—anaesthesia, paraesthesia, hyperaesthesia; (c) visceral—anorexia nervosa, vomiting; (d) trophic—vasomotor disturbances and dermatographia. The mental symptoms include amnesia, somnambulism, fugues, trances, hallucinations, deliria, dream-state and fits.

It is apparent that the symptoms may be regarded as a detachment and independent action of either a mental or bodily function. The fundamental psychic structure or hysteria is one of dissociation of the personality, the dissociated function being so isolated that it is capable of activity independently of other functions. It does not involve incongruities as does schizophrenia. A marked example of this is dual personality where one personality is in full possession of consciousness to the exclusion of the known normal.

4. *Psychasthenia.*—This condition is characterized by compulsions and obsessions usually associated with anxiety with anxiety and depression: by means of which it may easily be part of one of the previous pictures. The typical example is the person who is compelled to wash his hands hundreds of times a day because of an irresistible feeling that they have become contaminated. The familiar "folie de doute" is another example. The individual always goes

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back a second time to see that the door is securely locked when leaving the house. In psychasthenia are included such conditions as kleptomania, pyromania, dipsomania, and phobias.

5.—*Simple Depression.*—The outspokenly melancholic patient is easily recognized by his woe-begone look, by the slowing up of his thoughts and movements and by his complaints of torture that is worse than physical pain. He thinks he has lost all his money and will soon become the object of charity, and he may even threaten suicide. But in mild simple depressions the symptoms are not so obvious, though the complaints are such that they should excite suspicion. The patient may complain that he tires very easily, that he has "lost his pep," that he has less interest than formerly in his work and family, and that his digestion and sleep are disturbed. Such a person nearly always feels worse in the morning and gradually improves as the day wears on. He is only a step away from true melancholia and must be carefully guarded from the ever-existing danger of suicide.

Such a state may be a reaction to some grief situation, home break-up, financial loss, conjugal difficulties and not uncommonly may be accompaniment of the involutional period.

6. *Simple Elation.* — Although a nervous breakdown suggests a general decrease in mental and physical energy we cannot overlook entirely the elated states.

The markedly elated patient is easily recognized by his exalted mood, by the easy distractibility of his attention, by his tendency to flight of ideas and by his great pressure of activity in the undertaking of many projects. The mildly elated patient, however, falls far short of this description. He may think he is perfectly well and even those about him may say he is exceptionally healthy and vigorous. He has bright eyes, talks rapidly and often entertainingly, and his friends comment on how much he can do without feeling fatigued. We can demonstrate superficiality of thought and action, distractibility and over-activity which all betray ten hypomanic.

Even such a cursory survey of the different "nervous" types cannot help but leave us with the impression that it is very often difficult if not impossible to distinguish between them, and in the background of all but elation there is the neurasthenic and depressed behaviour. Again I should like to point out that it is perhaps unnecessary to attempt this differentiation, but it is wiser to interpret the symptoms and even treat the individual without making a definite diagnosis.

Prophylaxis.

In conclusion I should like to make a few remarks upon the value of prophylaxis in mental disease. The old adage, "an ounce of prevention is worth a pound of cure," is most applicable to the importance of mental hygiene, and it might be still more correct to say "an ounce of prevention is worth a ton of cure."

We must appreciate that here, too, there are extremes. On the one hand where the disease is caused by purely physical trauma, such as in the person who receives a blow on the head and is temporarily dazed, prevention is 100% accurate. On the other hand, we cannot prevent microcephalic idiocy after the idiot has been born, because it is purely hereditary in origin. The careful recourse to eugenic sterilization is the only means of stopping the propagation of such people. Between these two extremes we have the vast majority who suffer mental disease, whom we might reasonably expect would avoid such catastrophes were we to practice mental hygiene perfectly.

It is probable that most can be accomplished during infancy and childhood, so I shall confine my discussion to these periods. This has been referred to as "the golden age of mental hygiene."

The normal child has been described as "one who plays happily, or even ag-

gressively with others, occupies itself with concrete and objective things and interests, takes the knocks and disappointments of life casually and without prolonged rancour, confides freely and openly with its parents and companions, and happily substitutes another occupation for one that is forbidden, or at the time unavailable or inadvisable." To obtain such an ideal it is well to start our program with the infant. I shall only be able to mention a few of the high lights.

We should develop in the infant good appetites and proper habits of self-control whether at rest or play. Attend to its wants, make it comfortable and then leave it alone. We should severely condemn the pernicious habit some proud parents have acquired of disturbing the infant's peace of mind by making it dance or by bouncing it up and down to the delight of their friends. It should not be taken up each time it decides to air its lungs, but it is imperative that we see the tot is comfortable and there are no pins sticking in it before we leave it to its vocal efforts.

We must impress upon the parents to create a healthful environment for the child. They should be made aware of the harmful effects of the too highly strung mother or nurse-maid, of too much coddling or spoiling, of scolding, and nagging, of unreasoned and harsh discipline for incipient waywardness, and of bad teaching.

During the school period, personality defects come more prominently into view. The child is faced with adjustment to a world of other and strange children, to strange and more or less dominant adults, and to the regular tasks of the school-room. When some abnormality develops the child presents certain characteristics. "It keeps by itself; does not seem able to get on common ground with other children; gets absorbed in its own day-dream and fancies and resents being called out of them; is sensitive and takes knocks and disappointments as slurs or injustices, resents them, broods over them, and regards itself as a martyr; nurses its grievances in its own breast, not confiding its troubles to others, but continuing the sense of injury and injustice; in general, keeps its thoughts to itself; and when its chosen occupation is denied it, goes off by itself with a sense of injury and does not try to take up another, but lets its mind dwell on improductive fancies and vague, impractical aspirations." Such a child is more likely than others to become a mental invalid.

The management of these children very often determines whether or not they will break down. We must stimulate their interests so that any introvertive tendency will be destroyed. Games and group activities involving team work, and the judicious delegation of responsibility to the child, coupled with wise direction and control suited to his personality are of great importance. Teaching the use of reliance upon his own judgment is advisable, by first giving simple tasks at which he is successful and follow them with those of gradually increasing difficulty. It is of special value, in combatting later development of neuroses, to teach games in which a quick decision is necessary because continual conflict is the precursor of a neurotic constitution.

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Discussion.

The discussion subsequent to this paper stressed the inadequacy of the term "Nervous Breakdown." Such a label has become the "chic" thing, and the Ontario Mental Health Clinics are unwilling to accept this as a diagnosis. Other speakers declared the term a misnomer which might well be abolished. It is used by many as a means of continuing invalidism. If a case is not neurological or toxic in origin, yet giving the symptoms understood by the term under discussion, the patient should be classed as, and informed that he has, an emotional upset. Then the road is open for treatment by analysis of the underlying emotional factors. Such explanations are usually well received if tactfully expressed.

CARCINOMA OF BREAST

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Introduction.

In females, the breast comes second only to the uterus as a seat of election for malignant disease; one case of malignant disease in every three affects the breast. It will be found that nearly three-quarters of all tumours of the breast are carcinomatous, and that approximately 10% of the mortality from cancer in the United States is due to carcinoma of the breast.

Incidence.

Carcinoma of the breast is unknown before puberty, and very rare before 35, the usual age being 40-55, but the age of a patient must not lead one astray. I recall seeing a patient a short time ago who had a radical mastectomy performed for a proven carcinoma at 21 years of age, and they have been reported as late as 90 years of age. It must also be borne in mind that the younger the patient, the more malignant the growth; the disease progresses more rapidly, recurrences occur earlier, and there is usually a fatal termination. Females are much more commonly affected than males, but it surprised me to find that 1-2% of breast cancers do occur in males.

Etiology.

I do not intend to attempt any discussion on this part of my subject. I have read considerably on the etiology and am not much further ahead, and will dismiss this by saying that carcinoma of the breast appears to have similar etiological factors to carcinoma elsewhere in the body.

Anatomy.

In a discussion of such a condition, it is important to understand the lymphatic drainage of the gland and surrounding parts which is of necessity very abundant. From the subcutaneous lymph spaces fine vessels are gathered together which empty into larger lymphatics penetrating the breast perpendicularly to the plane of the surface. These in turn flow into vessels of the great plexus, which lies upon the deep fascia. The principal lymph channels lying upon the deep fascia follow the axillary border of the pectoral muscles and empty into the lymph nodes of the axillary region. Therefore the superficial axillary nodes, under the border of the pectoralis major, are in most direct communication with the breast, and are usually the first to become involved by the penetration of new growth. Through these the lymph glands associated with the axillary vein are reached, and finally the subclavicular and supraclavicular nodes. The mesial portion of the mammary gland is drained to a limited extent by channels which perforate the intercostal

spaces with the small branches of the internal mammary vessels and empty into the nodes of the anterior mediastinum. Anastomosis between the two breasts exists as well as a few channels crossing the clavicle directly to reach the supraclavicular group. The lymphatics from the lower and medial parts of the mamma anastomose with a lymphatic plexus on the sheath of the upper part of the Rectus Abdominis, and on the front of the linea alba between the Xiphoid process of the sternum and the seventh costal cartilage. The following summary will simplify this and show the unlimited powers of spread:

1. To axillary nodes—thence to subclavicular and supraclavicular. (Most important).
2. To any part of the body as part of the deep fascial plexus.
3. To supraclavicular nodes (direct).
4. To subclavicular nodes—when a channel exists. (50%).
5. To the plexus on sheath of upper part of Rectus.
6. To anterior mediastinal nodes.
7. To the opposite breast.

The importance of this description is easily understood since it is so intimately connected with the examination, treatment and prognosis of patients suffering from this condition.

The blood supply of the breast is abundant, being derived from the axillary, through the long thoracic, the intercostal and internal mammary systems.

Spread.

The following methods are described by Boyd as the means of spread:

1. *Infiltration*: The process, although earliest in point of time, is slow and of relatively little importance as a means of general dissemination. The familiar appearance of cancer cells arranged in columns in single file is an indication of the infiltration of tissue.

2. *Lymphatic*: This may be by permeation, i.e., along the vessels by multiplication or as emboli.

3. *Transcoelomic Implantation*: The cancer cells reach the plexus of the pleura and peritoneum through fine anastomoses with the plexus in the deep fascia. The cancer cells reach these, burst the lymphatics, escape into the serous cavities, and are distributed throughout these cavities by gravity and visceral movement.

4. *Blood stream*: It is easily understood how emboli of carcinoma cells could be caught and carried in the blood stream to any part of the body. The bones, particularly the flat bones containing red marrow, and those long bones which retain a little marrow in their proximal ends, are the most frequent sites of these deposits.

Pathology.

The following is a brief description of the pathology of the scirrhous type —by fár the commonest of the breast carcinomata.

Gross Appearance: On cutting such a tumour across, it gives a creaking, crepitating feeling to the knife, due to the presence of an abundance of fibrous tissue. On section it has a concave surface (again due to pull of fibrous tissue), and a greyish-white translucent appearance in contrast to the dense white colour of a fibro-adenoma and the yellowish tinge of cystic disease. If one scrapes the surface with a knife blade, it feels gritty, and a watery juice, often spoken of as "cancer juice," is obtained. Small yellow spots due to fatty degeneration will be seen in it, and there may be hemorrhages or cysts, while the central mass of the tumour often will be found to be sloughing and undergoing necrosis. The tumour mass, not being encapsulated, shades off into the surrounding tissue, thús making it impossible to tell where new growth ends and normal tissue begins.

Microscopic Appearance: The fibrous tissue elements are prominent,

there being only a comparatively small number of isolated groups of cancerous atypical spheroidal epithelial-like cells. They may be collected in small masses or columns, or they may be actually in single file. Being compressed by the fibrous tissue, they are usually distorted and may be small and dark staining. There is no attempt at glandular formation. Mitotic figures are rare.

Signs and Symptoms.

This type of growth may appear anywhere in the breast, but is most commonly found in the following order: Upper and outer, lower and outer, upper and inner, lower and inner quadrants respectively. The clinical manifestations are best divided into "early" and "late."

Early.—The early evidence of cancer appear so insidiously that it is only by the most constant watchfulness on the part of both patient and physician that a diagnosis can be made sufficiently early to give a reasonable hope of cure.

1. *Nodule*: It is likely to be noticed in bathing and drying the breast. This is a definite, irregular, hard, non-sensitive lump that cannot be moved independently of the breast, and shades away gradually into the adjacent breast tissue. There are several methods of examination used to detect the characteristics of the lump. When the cancer cells have passed up toward the skin, the fibrosis they excite shortens the fascial bands which join the skin to the mammary gland. Thus, an attempt to lift the skin in this area causes a dimple to form which is a fairly early sign of cancer. This is best elicited by placing the left hand at the upper pole of the breast, drawing a little skin down, and the right hand placed at the lower pole and drawing the skin up, again the breast may be grasped between the thumb and forefinger, and, by a combination of squeezing and lifting out, the dimple will appear.

2. *Pain*: In a few cases an occasional sharp twinge of pain has led to the detection of the lump, but, as a rule, pain and discomfort have been conspicuous by their absence. If the patient comes complaining of severe pain and a cancer is found, the growth is usually so far advanced as to be inoperable.

3. *Deviation of the Axis of the Nipples*: Choyce claims that to be a very early sign. The axis of the nipple on the affected side is often deviated slightly or obviously towards the growth. To elicit this sign, the patient must face the observer directly with shoulders square, and the direction of the two nipples carefully observed.

Late Signs:

1. *Adhesions to the Skin*: In the earlier stage of dimpling, the skin still moves over the subjacent growth; but later, actual adhesion becomes manifest over the centre of the growth.

2. *Adhesion to the Pectoral Fascia*: Early cancerous growths move freely with breast over the subjacent pectoral fascia; but in a comparatively early stage, especially if the growth is deeply seated in the breast, signs of fixation of the growth to the fascia become manifest.

3. *Local Flattening of the Contour of the Breast*: Cheatle has drawn attention to the local flattening of the curved contours of the breast, when the organ is viewed in profile, as a sign of carcinoma.

4. *Enlargement of the Axillary Glands*: Too often this sign is present by the time the patient seeks advice. At an early stage of glandular invasion the nodes are firm, rounded and discreet. At a late stage, the nodes are hard and often found in a lobulated mass. Since the axillary glands drain the arm as well as the thoracic wall, extensive involvement of the principal ducts is likely to cause a hard edema of the hand and arm — the so-called "brawny arm of breast cancer." Examination should also be made of the supraclavicular glands.

5. *Retraction and Elevation of the Nipple*: Retraction of the nipple occurs in one case out of four, and, when pre-

sent, usually indicates the proximity of the primary growth to the nipple. The whole breast is often drawn up towards the pectoral fascia, so that the nipple is situated on a higher level than that of the sound side.

6. *Shrinking of the Breast*: The whole breast becomes flattened and smaller than its fellow, owing to the conversion of its permeated lymphatic vessels into a network of threads of fibrous tissue.

7. *Ulceration*: Adhesion of the skin is soon followed by discoloration, infiltration and ulceration.

The examination of the breast should be as gentle and of as short duration as possible, since over-manipulation, particularly if intense, may cause dissemination of cancer cells. Such examination should also include X-ray of the spine, as carcinoma of the breast shares the honours with Thyroid, Adrenal, and Prostate as the commonest organs which metastasize in the spine.

Differential Diagnosis.

Space will permit but a short discussion of this part of my topic, but if you will bear in mind that any tumour of the breast in a woman of middle age or beyond, is carcinoma until proven otherwise, you will be very wise. The two common conditions so often confused with carcinoma are the much-talked of Chronic Mastitis and the cysts, and I will confine myself to these two.

The chronic interstitial mastitis is a very common condition and one often mistaken for carcinoma. The following points will aid one in differentiating it from carcinoma:

1. The whole breast is more or less involved.

2. The opposite organ is often similarly affected.

3. Enlargement of the auxiliary glands is less common, and even if enlarged are not so hard as in carcinoma.

4. The skin is usually free from the mass.

5. It is never adherent to the pectoral fascia, nor is it of the stony hardness of a scirrhous growth.

6. On careful palpation with the flat of the hand, it is often impossible to make out any distinct lump, the so-called tumour merging into the surrounding tissues.

It is no grave error to remove this breast, make a quick section, and if found malignant, proceed to a radical operation, as this condition is considered as one often showing malignant change.

Cysts are recognized by the facts that the growth is incorporated with the breast substance; that, on careful examination, an elastic resistance is transmitted to the fingers quite distinct from the stony hardness of a scirrhous growth; that there is no retraction of the nipple and no enlargement of the lymph. All growths of the breast should be transilluminated and, according to Dr. Bloodgood of Baltimore, all which are smaller than a twenty-five cent piece which do not transmit light should be removed. All growths over this size which transmit light should have a needle inserted and if clear fluid is obtained should be left alone; if bloody fluid is obtained, they should be removed.

Treatment.

While radium is making rapid advancement towards supremacy as the treatment in carcinoma of the breast, the radical operation still leads the field. In early cases operation should be strongly urged; in later cases, offered; and in still later cases, radium must be resorted to. The technique of the operation, as well as other operative details, cannot be embodied in such a paper. Suffice it to say that the breast should be removed in one mass with all underlying muscles, a very wide circle of fascia, all the contents of the axilla, and if necessary, of the supraclavicular triangle.

During the last two or three years many claims for radiotherapy have been made in the current literature. The operation for carcinoma of the breast has probably reached its final development, whereas radiotherapy is

still in its early stages. It seems agreed that X-ray therapy should follow the operation, and the time suggested is three to seven weeks after. In the British Journal of Surgery of January, 1932, will be found an extensive article setting forth the claims of radium to which I would refer the reader.

Prognosis.

The prognosis in rapidly growing tumours or in young patients is unfavourable, but since the modern operation has been performed some surgeons have been able to report from 50 to 60% of cases as free from recurrences at the end of three years, according to whether the axillary glands were found to be enlarged at operation or not. This is too short a time to claim a cure, for recurrences are sometimes seen as late as eight, ten or fifteen years afterwards. The average duration of untreated cases from the time of the first symptom to death varies from 27 months to 48 months.

GONORRHOEA

JESSIE C. GRAY, B.A., '34.

Gonorrhoea is an acute infection with a primary lesion, usually urethritis, and numerous secondary and systemic manifestations, of which more will be said later. The etiological cause of this disease is the Gonococcus of Neisser. This micro-organism is a Gram negative diplococcus occurring characteristically intracellularly. Its morphology will be discussed more fully under the bacteriological considerations.

The gonococcus is always found in both primary and systemic lesions, according to Osler's Modern Medicine. The disease occurs in men and women as a result of sexual intercourse, in the new born from vaginal infection of the mother, and in older children from accidental infection of the eyes or genitalia from soiled towels or linen, dirty fingers and contaminated toilet seats, and so on.

Pathology.

Since, whether the infection is of the eye or genitalia, a mucous membrane is involved in either case, the *pathology* of the disease is most simply described with reference to such a membrane. Surface colonies are formed on the membrane. It has been found that squamous epithelium is relatively resistant to the gonococcus, but this organism passes between the cells of columnar epithelium to reach corium and even submucous tissue. There is hyperaemia with exudation and purulent discharge. There is desquamation of epithelium and sometimes also a lymphangitis.

It may be of interest to note that the pathology of gonorrhoea in the male was determined by innoculating condemned criminals at various periods before death and examining the tissues immediately postmortem.

Rosenau makes the following comment: "Gonorrhoea is much more prevalent than syphilis, and common opinion regards it as a mild and not very shameful disease, that is, 'no worse than an ordinary cold. As a matter of fact, gonorrhoea is one of the serious infectious diseases, and the gonococcus occupies a position of high rank among the virulent pathogenic micro-organisms. From an economic and public health standpoint, gonorrhoea does not fall very far short of syphilis in importance; in fact, some give it first place."

There are three kinds of lesions in gonorrhoea: the primary lesion, that due to direct spread from the primary lesion, and systemic lesions. In the male, the primary lesion is frequently

accompanied by complications, such as involvement of the prostate, seminal vesicles, epididymis, or testes themselves. These are lesions due to direct spread. The most important result of gonorrhoea in the female is due to direct spread up through the uterus to the Fallopian tubes, here causing salpingitis. This process frequently causes sterility and rarely causes a peritonitis.

Gonorrhoeal Peritonitis.

Gonorrhoeal peritonitis occurs more often in women from spread up the Fallopian tubes than in men, in whom it spreads up the lymphatics of the spermatic cord. It has an acute onset, with pain in the lower abdomen, but there is no rigidity and no marked distension. It is frequently difficult to differentiate this from appendicitis. The lesions are comparatively slight, with a small amount of dry, fibrinous exudate. It has been aptly called peritonism rather than peritonitis. A pure culture of gonococci is frequently obtained from the peritoneum of such patients.

The two chief systemic manifestations of gonorrhoea are Gonorrhoeal Septicaemia and Gonorrhoeal Arthritis, along with which we will consider the Painful Heel of gonorrhoea.

Gonorrhoeal Septicaemia.

In a paper of August, 1930, Pugh says that it is now quite evident that gonorrhoea is a systemic disease, and that there is not a single organ which has not shown gonorrhoeal involvement. Many cases of *gonorrhoeal septicaemia* with pure gonorrhoeal blood culture have now been reported. The vast majority of such cases are fatal, though it is likely that cases of gonorrhoeal septicaemia producing symptoms like typhoid fever occur and clear up much more commonly than we suspect. This condition may give rise to a pyaemia with metastatic abscesses, and sometimes to a puerperal septicaemia. But the commonest manifestation is endocarditis, particularly with involvement of the Mitral valve. One case, which is fairly typical, ran as follows:—

A man, aged twenty years, acquired gonorrhoeal infection two months previous to admittance to hospital. On admittance the signs were an early furunculosis of chest, back and arms, sore throat, pains in all the joints, and profuse urethral discharge. Temperature varied daily from 99 to 104 degrees, with chills and sweats. Urethral smears were positive for gonococci during the first three months in the hospital, and negative at the last. Blood cultures were positive for gonococci the second, third, and part of the fourth months in the hospital.. The patient lost weight rapidly at first, and gradually developed a murmur along the left side of the sternum. Daily massage of the prostate and seminal vesicles, with irrigations of potassium permanganate and silver nitrate solutions were done. He would not allow incision into prostate and seminal vesicles for drainage. When the urethral condition began to clear up there was a marked improvement, till the patient was discharged, four months after admittance.

The treatment for gonorrhoeal septicaemia is the same as for any other septicaemia.

Gonorrhoeal Arthritis.

Gonorrhoeal arthritis is the most important of the systemic effects of gonorrhoea. It occurs in two to five per cent. of cases, and more frequently in males than females. Usually only a single joint is involved, though it may be polyarticular. The joints in order of frequency involved are: knee, ankle, wrist, fingers, great toes, elbow, shoulder, hip and jaw. It may occur at any age, though young adults are, of course, the most frequent sufferers. It is generally thought to be caused by the gonococcus itself rather than by soluble toxins, because the organism is frequently isolated from the joint. How the gonoccus reaches the joint is not definitely known, but it is believed to be carried to

the synovial membrane by the blood stream, because the organism is found in the blood in very severe cases of arthritis. This dissemination occurs in small numbers from some focus of chronic infection, such as the seminal vesicles or Fallopian tubes, etc. Arthritis may occur from an anterior urethritis, posterior urethritis or even from a conjunctivitis.

The joint involved is red, swollen, and excruciatingly painful. The lesion resembles a synovitis, though the effusion is not usually purulent. On puncture, plenty of fluid is obtained, and in the early stages gonococci are seen — sometimes in pure culture. There may be, however, secondary infection by staphylococcus or streptococcus. The condition closely simulates acute rheumatic fever.

The diagnosis of gonorrhoeal arthritis coming on during the acute stage of the gonorrhoea is easy. Frequently the gonococcus can be isolated, but, at any rate, the accompanying condition of the genitalia is highly suggestive. Chronic gonorrheal arthritis, however, is much harder to differentiate from arthritis deformans or rheumatic fever. The complement fixation test is resorted to and is of great aid in this case.

In the early stages the best treatment seems to be active attempts to dislodge the infection from the primary site by means of diathermy and antiseptics. In the later stages, diathermy may also be applied to the joint involved accompanied by Bier's hyperaemia, massage, tapping, tight bandaging, and so on. The general treatment is as for all diseases, namely, fresh air, good food, open bowels, etc. Vaccines and sera are of doubtful value, and the intervention of surgery usually makes matters worse. In fact, putting many opinions together, the best treatment for gonorrhoeal rheumatism seems to be rest in bed with immobilization of the joint.

The Painful Heel of Gonorrhoea is due to a local periosteal thickening and exostosis on the os calcis, causing great pain and disability.

Ophthalmia Neonatorum.

Another of the complications, or, rather, manifestations of gonorrhea is conjunctivitis of which there are infantile and adult forms. The infant form is known as *Ophthalmia Neonatorum*. Its high prevalence, judged by Rosenau to occur 10 times in each 1,000 births, is due to the great susceptibility of the child's conjunctiva. Rosenau said in 1916 that more than a third of the cases of blindness in the blind schools of Great Britain at that time were due to Ophthalmia Neonatorum. Infection usually takes place during birth as the eyes pass over the perineum. But it may take place in utero, the child being born blind or with a well advanced ophthalmia. Or it may take place after birth from contaminated cloths, fingers, instruments, and so on. The symptoms appear within forty-eight hours and consist of redness and great swelling with purulent discharge. The diagnosis depends on the finding of the gonococcus in smears direct from the eye. Prognosis depends on the stage at which the case comes under treatment. Prophylaxis consists in placing two drops of 1 or 2 per cent. silver nitrate in the eyes immediately on birth. This is done after washing the eyes free of mucus with cotton and elevating the lids so as to allow the nitrate to come into contact with the whole conjunctival sac. After this procedure, bathing each eye carefully and regularly with boracic acid solution is all that they require. This preventative treatment has reduced the frequency of this disease from 9 to 1 per cent. in hospital cases and in many states it is now compulsory to put silver nitrate in each infant's eyes at birth and to report all cases of Ophthalmia Neonatorum.

Gonorrheal Conjunctivitis.

Adult gonorrheal conjunctivitis is much more acute and severe than that of the infant. Diagnosis and treatment are the same as in the infant. Infection may be from external innoculation or may result from a gonorr-

heal septicaemia, the result in the latter case being much less severe than in the former.

Other complications of gonorrhea are Stomatitis or gonorrheal patches in the mouth occurring in the new-born infant; Proctitis or gonorrheal inflammation of the rectum which occurs in 25 to 30% of female gonorrheics due to the vaginal discharge infecting the rectum; Gonorrheal Thrombosis, neuritis and neuralgia, sciatica, meningitis, pneumonia, pleurisy, renal complications, cystitis, skin eruptions, and a long list of others too rare to mention.

We will now consider gonorrhoea as it occurs in the male.

Gonorrhea in the Male.

In the male practically the sole cause of gonorrhea is sexual intercourse. The incubation period is 5 hours to 7 days, the average being 3 to 5 days for a primary infection. During this time the subjective sensations are a tickling in the urethra, a feeling of fright and a desire to subject the penis to frequent inspection. At the end of the incubation period swelling of the urethral meatus with a purulent discharge of a greenish colour are noticed along with burning pain on urination and painful erection. These symptoms usually bring him to the physician. If the infection spreads back to involve the posterior urethra the symptoms are frequency, urgency and pain of urination with terminal haematuria.

The length of the incubation period and the symptoms following a history of suspicious coitus are almost sufficient for the diagnosis of gonhorrhea. In the early stages especially the *diagnosis* is very simple because gonococci are found in large numbers in the smears of the urethral discharge. In cases with scanty discharge the diagnosis is more difficult for two reasons: (1) The presence of pseudogonococci. (2) The presence of gonorrhea without gonococci. Under pseudogonococci come organisms with all the morphology of gonococci but Gram positive. There are, as well, similar organisms which are also Gram negative, but fortunately these are rare and they do not occur within pus cells and this is their differentiation point. It is wise to reserve the diagnosis of positive for cases with intracellular Gram negative diplococci in smears. As for gonorrhea without gonococci, this occurs in three types of cases: (1) Those who have received treatment before initial examination. (2) Those who have a mild exacerbation of a chronic infection. (3) Chronic infections free from symptoms as in the determination of a cure.

In the chronic stages of the infection, the shreds in the urine are more important than the urethral discharge, and though this shreddy discharge in the urine may be the only symptom, the individual is still highly dangerous to the opposite sex. Before a diagnosis of negative may be made on a man once definitely positive, an extensive examination must be done, including vigorous massage of the prostate and seminal vesicles and investigation of the urethra for pockets and strictures. Negative results are of no value until three negative reports have been obtained after various periods and three different methods of provocative treatment such as instrumentation of the posterior urethra without medication. massage of the prostate and seminal vesicles without medication or irritating foods and violent exercise without medication.

As a rule smears are as valuable as cultural methods in diagnosis, but after prostatic massage cultural methods are more important because in the prostatic fluid gonococci are not found intracellularly and hence this important differentiating point is lost. Cultural difficulties prevent this aid to diagnosis in many small laboratories. Human blood is a good enricher of the media, 1% agar being used. Conditions of proper warmth and moisture must, of course, be scrupulously maintained.

The cultural proof of gonorrhea is absolute, according to Herrold, but frequently it is impossible to isolate the gonococci because of secondary infection. In this case Gram stained smears are presumptive diagnosis.

Practically no information can be obtained by serologic methods that cannot better be established by smears and cultures plus the clinical symptoms. The value of the complement fixation test is in the differentiation of post-gonorrheal complications associated with negative genital results. Skin reactions with toxins and vaccines have, so far, proved of no value.

Aside from the actual diagnosis, the lesion must be localized, and for this the patient is required to pass his urine in three parts massage of the prostate and seminal vesicles being done between the second and third parts. Now specimen No. 1 contains urethal washings plus any elements from bladder, ureters and kidneys; No. 2 contains elements from bladder, ureters and kidneys alone if the first portion has been sufficient to thoroughly wash the urethra; No. 3 represents elements from the bladder, ureters and kidneys plus the products massaged from the prostate and seminal vesicles. Hence from the examination of these three specimens, the site of infection can be localized.

The *Complications* of anterior urethritis are abscesses of the urethral glands and surrounding tissues and inflamation of the erectile tissues, glans penis and prepuce. But the complications of gonorrhea which arise due to infection passing beyond the compressor urethrae muscle are the most important and are as follows:

Epididymitis is diagnosed by a painful swelling of the lower pole of the epididymis which may rapidly involve the whole organ. It is accompanied by a fever which rarely goes beyond 102 degrees. The history plus a positive smear after massage of the organ or accompanied by swelling of the organ clinch the diagnosis. Involvement of the testicle is determined by torsion of that body. If smears show pus, but no gonococci, the complement fixation test may be of value. Treatment is to put the patient to bed with a bandage which immobilizes and elevates the scrotum. If this is not effective, surgical interference is necessary. Abscesses should be opened as soon as diagnosed.

Prostatitis and peri-prostatitis are diagnosed by swelling and pain in the prostate feeling like "a hot potato up the rectum." Whether the peri-prostatic tissues are also involved is determined by whether or not the lobes of the prostate can be distinctly felt on palpation. If there is abscess formation the pain becomes more intense and fluctuation may be elicited. These conditions are treated by frequent hot rectal irrigations, and if this is not sufficient the "sound" operation is employed for prostatitis and open operation for prostatic abscess. Abscesses usually have to be opened and drained.

The *treatment* of gonorrhea in the male depends on the time after infection that the man comes to the doctor as well as on the extent of the infection. It may also be divided into general and local treatment.

Prophylactic treatment is undertaken if the patient comes to the doctor within three or four days of intercourse. This consists of sealing a germicide into the urethra and leaving it for 3 to 5 hours. If this is done within 24 hours of intercourse, infection is avoided without treatment. If after 48 hours, one treatment is given; if after three days, two treatments are given, and after four days, three treatments. After longer than this a definite course of treatments is carried out, consisting of the following general precautions: The patient must get plenty of sleep with as little exercise as possible, no irritating spicy foods, no long motor trips, no beer parties and no sexual excitement—not so much as the reading of a love story or seeing a suggestive moving picture. Constipation is avoided and the drinking of large amounts of water to flush the

urethra often is urged. Oral medication is of value in producing diuresis and to keep the urine less acid and therefore less irritating, but no gonococcicidal effects are obtained in this way. Local treatment may or may not be begun until after the acute stage. It consists of daily injections of mild antiseptics in such a fashion as not to spread the disease to the posterior urethra in cases where this region is not involved. The favourite germicides are protargyrol and silver nitrate, though potassium permanganate and mercurochrome have also proved of some value. Some say that warm protargyrol irrigations are best as long as the urine is cloudy due to pus. When the urine is almost clear and contains shreds, the more irritating silver nitrate is the drug of choice. The average length of this treatment is six weeks. Intravenous injection of mercurochrome with glucose is of doubtful value and should be undertaken only with great care. Foreign protein therapy is of distinct aid in the treatment of gonococcal complications.

Chronic gonorrheic infection may be due to the gonococcus, to the gonococcus plus some other organism or to some other organism alone. The chief extraneous offender is the staphylococus pyogenes. The causes of chronic gonorrhea in the male according to a paper by Greenslade in April, 1931, are as follows:

1. Insufficient treatment due to a lack of realization of the seriousness of the disease or to poor conditions of treatment as in sailors and others whose occupations prevent regular treatment by the same physician. Or it may be due to the consulting of quacks who hand out a syringe with some ridiculous medicament for injection and tell the patient he is as good as cured.

Inefficient Treatment. — Acute cases become chronic due to the wrong kind of treatment, for example, the use of too strong antiseptic solutions, or too great pressure in irrigations. Both of these procedures destroy the mucous membrane and drive the gonococci deeper or introduce the infection into Cowper's glands or the epididymis, etc., where there are formed sources of chronic infection. The practice of training the patient to self treatment is also the cause of chronicity in many cases, the patient optimistically regarding himself cured each time the discharge diminishes. Faulty massage of the prostate is responsible for many chronic cases and may cause infection of the epididymis. Forcible dilatation and the passage of instruments oftener than once a week also causes chronic infection.

3. Alcohol and sexual intercourse of course prejudice the patient's chance of cure. The cure of gonorrhea depends, more than on any treatment so far discovered, on the development of an individual immunity to the gonococcus. Hence it is very important that his general health be kept up and no excesses be indulged in which will weaken his resistance.

4. Poor resistance to the gonococcus. This apparently does not depend on the general condition of the patient, very athletic chaps frequently being the least resistant. This, however, should never be used as an excuse for giving up the treatments, because it is a very small factor in any case.

Chronic anterior urethritis is characterized by urethral discharge, tendency for acute exacerbations, pain, itching or burning in the urethra and urinary symptoms. The symptoms of chronic posterior urethritis are urethral discharge, disturbances of and mechanical obstruction to urination, reflex pains and abnormal sensations and sexual disturbances.

An acute exacerbation of a chronic gonorrhea is most commonly caused by alcoholic or sexual excesses and is distinguishable from a primary attack of the disease by its more rapid and acute development. Also, though the discharge is yellowish or creamy green as in a primary attack, it returns more quickly to the thin glairy type charac-

teristic of the chronic gonorrhea. Precautions regarding habits apply here as in the primary infection. The treatment of a chronic case is much more prolonged, difficult and tedious and the patient, as a rule, is much harder to restrain from breaking over the traces. All the sites of chronic infection must be investigated and, if involved, cleared out. Intercourse should not take place till at least six weeks after the disappearance of the "morning drop," as the single thin grey drop of pus appearing at the urethral meatus first thing in the morning is chronic gonorrheics is called.

Shreds in the urine have the following significance: they do not necessarily indicate gonorrhea, but they do mean localized areas of urethral inflammation. Except for the small, fine, comma-shaped threads which indicate prostatitis, the size and shape of the threads have no significance.

In the *determination of a cure*, the clinical picture plus consistently negative smears even after alcoholic excesses and other provocative tests such as dilation of the urethra and silver nitrate applications plus a negative complement fixation test is pretty definite evidence of cure in spite of the continued occurrence of shreds in the urine.

Gonorrhea in the Female.

Gonorrhea in women is more formidable than in men for the following reasons: Leucorrhea, which occurs in all women to some extent, masks the fact to the woman herself till the inflammatory process has spread up and the pelvic organs are hopelessly infected. The initial symptoms are mild and false modesty prevents her consulting a physician. Treatment cannot be given during the menstrual period. Doctors have a tendency to perform an inadequate examination.

As to *prevalence* there is no accurate method of compiling statistics, of course, but the percentage in women is quite great and steadily increasing due to the facts that so many husbands are infected and the profession has not as yet wakened to the gravity of the situation. The occurrence in women is generally placed at 10 to 11%, though some men believe it to be as low as 4% in the United States.

The *parts principally involved* in order of frequency are the urethra, the cervix and Bartholin's and Skene's glands. The gonococci spread rapidly to the subepithelial tissues from which it is practically impossible to dislodge them. It is an ascending infection and in spite of the fact that the organisms are non-motile, it passes up against the cilia current to infect the endometrium, Fallopian tubes and, eventually the ovaries. This upward spread may be accounted for by the lymphatic drainage which is very dense about the uterus and which might explain the rapid ascent of the infection. When the infection involves the Fallopian tube, pus escapes at both ends, producing adhesions and closure to a pus sac, after which the symptoms subside, the pus becomes sterile and gradual absorption takes place. This and the involvement of the ovaries stage the well-known flare-up at menstruation occur.

As for the *symptoms*, in severe cases there is burning and smarting on urination. The discharge becomes purulent and may be yellowish green or blood stained. In chronic cases the discharge loses its purulent character. The symptoms depend on the sites of infection.

The *clinical course* of gonorrhea is, as a rule, much less dramatic, though more tragic, in the woman than in the man. The incubation period is the same, about 2 to 7 days, the symptoms, during this period, being so slight as to be passed over. When the disease actually makes itself apparent, it may be acute with profuse discharge, frequency and pain of urination and general pelvic pain. More frequently there is only a mild discharge with smarting on urination. The acute stage usually lasts about two months and may never be violent enough to bring

the patient to the physician, though she may wonder about the discharge.

The diagnosis and treatment in the female are even more important than in the male, since there are three dire possibilities, viz.: Production of sterility, arthritis, salpingitis, etc., in herself; transmission to the male; the progeny being born blind. The man has only transmission to his family and sterility in himself or arthritis to fear.

The *diagnosis* depends on a history of suspicious intercourse, the clinical symptoms and the finding of gonococci in the discharge, and this again is more difficult than in the male, due to the facts that the history is harder to elicit and the frequency with which leucorrhea occurs to some degree in all women.

There are many methods of *treatment* of gonorrhea in women and many investigators guarantee the various means, but the truth of the matter seems to be that none of the methods so far tried are sufficiently effective to eradicate the disease with certainty. The cervix is the commonest site of chronic infection and hence treatment of it has been investigated most. The methods may be divided into destructive and non-destructive. The former are not ideal in that they should not be undertaken when future pregnacy is a consideration. Three destructive methods are cautery, the heat being applied slowly and with discretion so as not to cause necrosis, followed by packing with gauze soaked in 10% mercurochrome; surgical removal of the area containing infected glands; and radium inserted into the cervical canal for various intervals.

Two apparently effective methods of non-destructive therapy which have been investigated recently are protein therapy, of example, the injection of milk to produce protein shock; and fever treatment, which consists of immersion in a bath of 107 to 110 degrees Fahrenheit, which keeps the body temperature up to 106 to 108 degrees for an hour. These are given twice to eight times in four days and remarkably good results in the treatment of gonorrheal pelvic inflammation are reported.

With regard to this last, Boland in a paper of November of last year on the results of experimentation with diathermy in gynocology at the Boston City Hospital, states that through and through body heating heating does not raise the uterine temperature above 100 degrees. He also found that while 118 degrees is the highest moist heat the vagina can tolerate, one exposure to a heat of 110 to 113 degrees did not kill gonococci. Hence diathermy is not a very superior method of treating gonorrhea. It has, however, its particular cases on which it is effective and one group that seems to react very well are those cases on whom a supravaginal hysterectomy and bilateral salpingectomy have been done, the stump of the cervix being infected. The stump, in these cases, may be rendered sterile by this method.

As to the determination of a cure, it is believed that if the infection is limited to the urethra and vulva or does not extend beyond the cervix, that it can be cured by careful and persistent treatment. If, however, it extends beyond the cervix, the hope of cure is very slight.

Vulvovaginitis of Childhood.

Vulvovaginitis of childhood is gonorrheal infection of the vulva and vagina of little girls due to contaminated towels, linen, toilet seats, etc. There is a profuse discharge with a red and swollen vulva and pain on unrination, and possibly on walking too. The diagnosis depends on finding the gonococus. Dooley, in November, 1931, presented a paper in which he showed that this disease in childhood, though persistent and sometimes lasting for years, is not a serious cause of sterility or even of dysmenorrhea in adult women. The treatment of vulvovaginitis is to keep the child in bed and bathe frequently preserving absolute cleanliness. Argyrol solution is used till the acute phase is over and then 1% silver nitrate is applied.

The following results of Terwilliger, published last year on the effect of gonococcal vaccination in cases of infantile vulvovaginitis may be of interest. 36 children, 19 of whom had the disease, were used. After a primary flare-up due to the provocative effect of the vaccination, 16 of the 19 were cured, while the other 3 showed very little discharge and did not have an exacerbation of symptoms on introduction into the ward of a new acute case as they used to before vaccination. Two of the 19 were merely suspicious, and on vaccination developed into typical clinical cases, indicating the diagnostic value of vaccination. None of those of the non-infected group who were vaccinated developed the disease even when mildly exposed to it, whereas one of the non-infected group who were not vaccinated did develop it, indicating that vaccination also produces some immunity in non-infected patients.

Laboratory Findings.

With regard to *gonococcus vaccines,* stock or autogenous vaccines may be used, the latter having the disadvantage of requiring time to prepare and therefore not being on hand when needed. Eleven strains of gonococci have been separated and stock vaccines are prepared from various mixtures of these strains. The dosage is usually 50,000,000 increased 25,000,000 with each dose till a mixmum of 200,000,000 is reached. These are injected intramuscularly not oftener than every other day. This method is of particular value in cases of acute prostatitis, epididymitis, vesiculitis and peri-urethral lesions.

Specific antibodies consisting of opsonins, agglutinins, bacteriolysins and complement-fixing antibodies occur in the blood of chronic gonorrheal patients and such sera are produced also in goats, rabbits, sheep and horses to be used in cases of acute arthritis and epididymitis though of little avail in acute urethritis or chronic gonorrheal conditions.

Complement is fixed or deviated by the combining of the gonococcal antibodies of the patient's serum with the gonococcal endotoxins of an antigen and this fixation of complement prevents the lysis of red blood cells when added to the tube. This test is known as the *Complement Fixation Test* and is positive only in cases of chronic infection and in these, only in the chronic phase. Vaccines cause a patient who has recently had a gonorrhea to have a strongly positive complement fixation test in place of a weekly positive one.

Though technical errors are rarer in this test than in the culturing of gonococci, the culturing is a much surer evidence of gonorrhea than the test. The reason for this unreliability is that, though in general a positive test means gonococci in the body, the presence of antibodies in the blood after the organisms are gone gives an erroneous positive test. On the other hand, variations in the different strains of gonococci explain some of the misleading negative results.

The Simon technique for the Complement Fixation test is to grow at least six different strains of gonococci on salt free, neutral veal agar. After 24 hours the cultures are washed off with distilled water and heated for two hours in a water bath at 56 degrees Centigrade. The suspension is then centrifuged and filtered through a Berkefeld filter. When you want to use this antigen, salt solution is added to bring it up to .9% and it is heated in glass beads on three consecutive days to insure sterility. The strength of antigen is ascertained by titrating it with a known positive serum or with an anti-gonococcic serum. The technique in all other respects is identical with the Wasserman test.

The *blood pathology* in gonorrhea is very unreliable. Roughly, it may be said that mild cases show no leukocytosis while in severer cases there is increase in the neutrophile leucocytes. Gonococcal bacteremia occurs, of course, when there is generalized systemic infection. The gonococcus

complement fixation test furnishes a positive result in a large percentage of chronic cases while it is commonly negative during the acute stage. It is, according to Simon, the most important method of determining whether the disease has been eradicated or whether a residual infection still exists in the body.

Gonorrheal pus in the acute stage consists principally of polymorpho nuclear leucocytes and the gonococci, which vary in number with the severity of the malady, occur in these pus cells. In the more chronic stage the discharge decreases, lymphocytes endothelial and epithelial cells increase, and the organisms are frequently not to be found.

The *urine* in gonorrhea varies with the site of infection. If confined to the anterior urethra, the first portion only contains pus. If extending to the neck of the bladder the second portion has a variable appearance. When there is cystitis, the second portion is at least as turbid as the first and often the last two of three drops are pure pus. In chronic gleet, what are known as gonorrheal threads appear in the urine. Frequently it is impossible to find organisms in these threads which are yellowish white and one centimeter in length, or under.

Before closing it may be well to mention that *surgery in gonorrhea* consists in surgery of its complications and is administered principally in the form of drainage either by incision, puncture or dilatation. By far the commonest necessity for surgery is for the relief of abscess formations along the urethral canal. Prostatic abscesses form the next common demand for surgery. Although acute gonorrheal epididymitis is by far the commonest acute complication, it only rarely requires surgical intervention. With regard to strictures of the urethra, "Dilate if you can and cut if you have to" is the maxim of J. William White, and considered by many to be a good one.

Osler says: "Man wages keen warfare against all other infections except gonorrhea and syphilis alone. The treatment of gonorrhea especially is administered in a hopelessly apathetic manner. From the standpoint of race conservation gonorrhea is a disease of the very first rank, causing from 30 to 40% of all cases of congenital blindness, the majority of pelvic inflammations in women, and the unhappiness associated with sterile marriages. While not a killer, as a misery producer Neisser's gonococcus is king among germs."

A disease that changes the daily routine of the man and may invalid the woman; a cause of the major gynaecology of to-day; unsexing thousands of women and causing 40 to 50% of sterility in man; a disease that in this country causes a quarter to a half of the congenital blindness; should indeed be considered a real peril to society.

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INTERNESHIPS IN CANADIAN HOSPITALS

With the kind co-operation of the Department of Hospital Service of the Canadian Medical Association, this Journal is publishing herewith a list of Canadian Hospitals approved for internship.

The Basis of Approval, which was adopted after considerable consultation between the Canadian Medical Association, the Deans of the various medical colleges and leading hospital administrators, outlines the arrangements which must be made and the facilities which must be offered by hospitals. It is pointed out that the object of a general internship is twofold; it is both to provide efficient resident service for the patients and to round out the medical graduate's training so as to equip him to enter into the general practice of medicine. It is not to equip him to enter directly on any specialty.

In preparing the list of approved hospitals, the Committee of Approval has accepted only those which have a highly organized and conscientious medical staff, an up-to-date laboratory, a medical library, good records, autopsies on at least ten per cent. of the patients dying in the hospital, a satisfactory intern schedule and afford the interns ample opportunity for instruction. It is exceedingly gratifying to note that so many general hospitals in this country meet the requirements set forth and afford the graduate a year's training equal at least to that obtainable elsewhere. In a number of the hospitals a generous honorarium is provided, although it should be emphasized to the senior student that the difference of a few dollars is a very minor factor in comparison with the clinical experience offered.

A number of excellent hospitals which afford the intern good clinical training, but which do not fully comply with the Basis of Approval in one or more details, are being "recommended" rather than "approved," and these hospitals will be noted in the official list appended.

The list we print, for the sake of clarity, does not give all the details of the several services in these hospitals. Further information will be given gladly by Dr. G. Harvey Agnew, Secretary of the Department of Hospital Service at 184 College Street, Toronto.

We are informed that United States immigration regulations are not so stringent as those of last year. To enter the United States to accept a hospital appointment, it will be necessary to provide satisfactory assurance to the proper officers that the applicant for admission will return to Canada at the conclusion of his internship.

APPROVED HOSPITALS.

Victoria General Hospital, Halifax, N.S.: 250 beds; no women; selected May; begins May 15; on call for O and E.

St. John's General Hospital, St. John, N.B.: 300 beds; 8 internes; women; selected autum; begins July 1; O. and E. 6 weeks.

Children's Memorial Hospital, Montreal, Que.: 190 beds; 10 internes; women; selected December; begins July 1; part time O. and E.

Montreal General Hospital, Montreal, Que.: 485 beds; 47 internes; women; selected December; begins July 1; O. and E.

Royal Victoria Hospital, Montreal, Que.: 690 beds; 45 internes; no women; selected March; begins July 1; O. and E. 3 months.

Ottawa Civic Hospital, Ottawa, Ont.: 540 beds; 17 internes; no women; selected January; begins July 1; O. and E. 1 month.

Kingston General Hospital, Kingston, Ont.: 375 beds; 4 graduate internes; no women; selected January; begins June; O. and E.

Grace Hospital, Toronto, Ont.: 121 beds; 4 internes; no women; selected January; begins July 1; O. and E. 3 months part time.

Hospital for Sick Children, Toronto, Ont.: 387 beds; 17 internes; women; selected February; begins July 1; O. and E. 3 months.

St. Joseph's Hospital, Toronto, Ont.: 250 beds; 6 internes; women; selected July 1; begins January and May; O. and E. 3 months.

St. Michael's Hospital, Toronto, Ont.: 552 beds; 22 internes; no women; selected December and January; begins July 1; O. and E. 2 months.

Toronto East General Hospital, Toronto, Ont.: 135 beds; 2 internes; no women; selected April 1; begins July 1; O. and E. on call.

Toronto General Hospital, Toronto, Ont.: 1,050 beds; 43 internes; women; selected January; begins July 1; O. and E. 4 months.

Toronto Western Hospital, Toronto, Ont.: 312 beds; 15 internes; no women; selected December; begins July 1; O. and E. 3 months.

Hamilton General Hospital, Hamilton, Ont.: 618 beds; 20 internes; no women; selected December; begins July 1; O. and E. 6 weeks.

St. Joseph's Hospital, London, Ont.: 275 beds; 6 internes; women; selected January 15; begins July 1; O. and E. on call.

Victoria General Hospital, London, Ont.: 400 beds; 14 internes; women; selected December; begins July 1; O. and E. 6 weeks.

Metropolitan General Hospital, Walkerville, Ont.; 126 beds; 2 internes; women; selected January; begins July 1.

Hotel Dieu of St. Joseph's Hospital, Windsor, Ont.: 113 beds; 2 internes; no women; selected May; begins July 1.

Children's Hospital, Winnipeg, Man.: 125 beds; 7 internes; women; selected January; begins June 1; O and E. 2 months.

Winnipeg General Hospital, Winnipeg, Man.: 628 beds; 25 internes; women; selected November; begins June 1; O. and E. 2 months.

St. Boniface Hospital, St. Boniface, Man.: 435 beds; 4 internes; women; selected November; begins June 1; O. and E. 1 month, 4 months part time.

Regina General Hospital, Regina, Sask.: 388 beds; 8 internes; women; selected October; begins July 1.

Royal Alexandria Hospital, Edmonton, Alta.: 460 beds; 6-8 internes; women; selected January; begins May 1 and July 1; O. and E.

University of Alberta Hospital, Edmonton, Alta.: 376 beds; 10 internes; no women; selected April 1; begins July 1; O. and E.

St. Paul's Hospital, Vancouver, B.C.: 271 beds; 4 internes; no women; selected January; begins July 1; O and E. 3 months.

Vancouver General Hospital, Vancouver, B.C.: 1,042 beds; 35 internes; women; selected December; begins July 1; O. and E. 2 months.

Recommended Hospitals.

Homeopathic Hospital of Montreal, Que.: 90 beds; 3 internes; women; selected February 1; begins June 15; O. and E.

Hopital St. Luc, Montreal, Que.; 407 beds; 12 internes; women; selected April; begins July 1; O. and E.

Women's General Hospital, Montreal, Que.; 185 beds; 6 internes; women; selected August; begins August; O. and E., rotating.

Christie Street Hospital, Toronto, Ont.; 600 beds; 3 beds; no women; selected April; begins July 1; O. and E., 3 months.

Brantford General Hospital, Brantford, Ont.; 181 beds; 2 internes; no women; selected January; begins July 1; O. and E. on call.

Westminster Hospital, London, Ont.; 700 beds; 2 internes; no women; selected May; begins July or September.

St. Catharines General Hospital, St. Catharines, Ont.; 148 beds; 2 internes; women; selected January or February; begins July 1; O. and E. V. D. Clinic.

Grace Hospital (for Obstetrics only), Winnipeg, Manitoba; 125 beds; 2 internes; women; begins July 1; O. and E.

Moose Jaw General Hospital, Moose Jaw, Sask.; 160 beds; 2 internes; women; selected February-May; begins June; O. and E. on call.

St. Paul's Hospital, Saskatoon, Sask.; 250 beds; 3 internes; no women; selected October; begins June.

Saskatoon City Hospital, Saskatoon, Sask.; 226 beds; 8 internes; no women; selected December; begins July 1.

Provincial Royal Jubilee Hospital, Victoria, B.C.; 298 beds; 2 internes; no women; selected Autumn; begins July 1.

Notes on the Table.

Internship is by appointment, except at the Victoria General Hospital, Halifax, N.S., where it is by examination.

The length of internship is 12 months, except at the Moose Jaw General Hospital, Moose Jaw, Sask. There the appointment is 11 months.

O. and E. in above refers to Outdoor and Emergency service.

SULPHOLEUM AND THOROTRAST

In his clinical classes, the attention of the student may have been drawn to two new agents used for therapeutic and for diagnostic purposes respectively, Sulpholeum and Thorotrast. Brief mention of these in this Journal may not come amiss.

Sulpholeum is a one per cent. solution of sulphur in pure olive oil. It is used as a pyrexia-producing agent in general paresis, tabo-paralysis, epidemic encephalitis, and certain other diseases of the nervous system. Injection is made intramuscularly in doses of from 0.5 to 10.0 cubic centimetres, dependent on the degree of pyrexia it is desired to produce. Two injections of the smaller doses are made first to determine the effect of the drug in that individual patient. Pyrexia and an increase in the number of the leucocytes of from 100 to 300 per cent. occurs within twenty-four hours. The temperature returns to normal again in 72 hours. Thus two injections weekly produce a temperature chart for the patient very similar to that he would show if treated with quartan malaria. For further details of the use of this drug, attention is drawn to an article

by Knud Schroeder in "The Lancet" of November 23rd, 1929, page 1081.

Thorotrast, a colloidal solution of 25 per cent. thorium dioxide of high dispersion and low toxicity, possesses the property, when injected intravenously, of depositing itself in the cells of the reticulo-endothelial system. Liver, spleen, bone marrow and lymphatic glands receive deposits of this substance particularly, and a solid white shadow of liver and spleen may be obtained with a dose of 0.8 cubic centimetres per kilogram of body weight. In addition to use in liver and spleen conditions, thorotrast has been employed to outline vessels of the brain. In such cases, it is injected into the common carotid artery. The placenta, too, may be visualized through the use of this drug. On account of its lack of irritating properties, and its strong radio-opacity, thorotrast is an excellent contrast medium which has certain advantages over those media commonly used in urography. The work of Dr. W. H. Dickson, in the Canadian Medical Association Journal, 1932, volume 27, page 125, should be consulted for further details.

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